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New record of *Caloptilia cuculipennella* (Hübner, 1796) in Belarus (Lepidoptera: Gracillariidae)

A. V. Sinchuk, N. V. Sinchuk & S.V. Baryshnikova

Abstract

Caloptilia cuculipennella (Hübner, 1796) was first discovered on the territory of Belarus. It is assumed that this species is distributed throughout the country. *Fraxinus excelsior* L., is indicated as a host plant. This species is the 7th representative of the genus *Caloptilia* Hübner, [1825] for the fauna of Belarus.

KEY WORDS: Lepidoptera, Gracillariidae, *Caloptilia cuculipennella*, Belarus.

Nuevo registro de *Caloptilia cuculipennella* (Hübner, 1796) en Bielorrusia
(Lepidoptera: Gracillariidae)

Resumen

Caloptilia cuculipennella (Hübner, 1796) se descubre, por primera vez, para el territorio de Bielorrusia. Se asume que esta especie se distribuye por todo el país. Se demuestra que su planta nutricia es *Fraxinus excelsior* L. Esta es la séptima especie del género *Caloptilia* Hübner, [1825] para la fauna de Bielorrusia.

PALABRAS CLAVE: Lepidoptera, Gracillariidae, *Caloptilia cuculipennella*, Bielorrusia.

Introduction

Extensive genus *Caloptilia* Hübner, [1825] (Lepidoptera: Gracillariidae) has over 300 species of the world fauna and is represented in Europe by approximately 25 species (DE PRINS & DE PRINS, 2006-2019). At present, six species of Gracillariidae of the genus *Caloptilia* are known for the territory of Belarus: *Caloptilia populetorum* (Zeller, 1839) (ARIKO & SAUTKIN, 2017), *Caloptilia rufipennella* (Hübner, 1796) (EVDOSENKO, 2016; PROKOPOVICH, 2008), *Caloptilia alchimiella* (Scopoli, 1763) (KUZNETSOV & BARYSHNIKOVA, 1998; MERZHEEVSKAYA *et al.*, 1976; SETRAKOVA, 2014), *Caloptilia stigmella* (Fabricius, 1781) (PRÜFFER, 1947), *Caloptilia hemidactylella* ([Denis & Schiffermüller], 1775) (ARIKO, & SAUTKIN, 2017; EVDOSENKO, 2016; PISANENKO *et al.*, 2019), and recently recorded *Caloptilia roscipennella* (Hübner, 1796) (SINCHUK *et al.*, 2020). The inspection of various tree species for searching new mining Lepidoptera in Belarus has revealed another species of this genus, *Caloptilia cuculipennella* (Hübner, 1796), trophically related to common ash.

Fraxinus excelsior L. (Oleaceae) is an important forest-forming species in Belarus. Ash forests are valuable not only as a source of exceptionally high-quality wood and by-products, but also as a powerful regulator of biosphere processes, an accumulator of huge reserves of deposited carbon, an object of environmental biodiversity, an invaluable recreational resource (ZVYAGINTSEV & SAZONOV, 2005).

The natural range of the common ash tree covers almost all of Europe with the exception of the northernmost and southernmost parts, from the Atlantic coast in the West to the Volga river in the East. The northernmost point of its natural range is in Norway, approximately 64° North latitude. The southern border reaches 37° North latitude in Iran (CHUMAKOVA & VASIL'EV, 1984). The largest areas of ash forests within the Russian plain are concentrated in Ukraine, Belarus, and the southern Baltic States. Belarus is located in the Central part of the ash tree range and the climate conditions throughout its territory are quite favorable for the growth of this breed.

In the "Catalog of Lepidoptera of the Russian Empire" for the North-Western provinces (Estonia, Livonia, Courland, Pskov, Mogilev provinces. Vitebsk, Vilna, Kovno, Grodno and Minsk provinces and Poland are almost not processed, Pskov province is very poorly studied and only in places) the species *Coriscium cuculipennellum* Hb. (= *Caloptilia cuculipennella* (Hübner, 1796)) (ERSHOV & FIELD, 1870) is specified. However, there is no specific indication that the moth is located within the modern borders of Belarus (figure 1). At the moment, the spread is recorded in neighboring countries: Lithuania, Latvia, Poland, Ukraine, and Russia (DE PRINS & DE PRINS, 2006-2019).

In addition to *C. cuculipennella*, *Gracillaria syringella* (Fabricius, 1794) was previously recorded as a phylophage of *Fraxinus excelsior* L. on the territory of Belarus (SAUTKIN & EVDOSHENKO, 2013).

Material and methods

Inspections were conducted in green spaces in all regional centers and some other localities of Belarus in 2020. The leaf blades found to be damaged by insects were collected in sealed plastic bags with a Zip-Lock of various sizes. The material, damaged by phylophage, was herbarized (SKVORTSOV, 1977). Identification of pests by damaged leaf blades was carried out using specialized keys (ELLIS, 2001-2020; PITKIN *et al.*, 2019).

This article is based on the material of damaged leaves of common ash (figure 2) from Gomel, N52.429889, E31.025869 (accuracy: 29 meters), collected on 19-IX-2020 (leg. A. V. Sinchuk, N. V. Sinchuk). The herbarium is kept in the personal collection of A. V. Sinchuk.

Results

Identification by damages on leaves (figure 2: A, B) allowed us to establish a new species of phytophagy, *Caloptilia cuculipennella*, for Belarus, whose caterpillars feed on common ash. When a large number of damages are formed on one leaf, its deformation becomes noticeable (figure 2: C). After leaving the mines, the caterpillars feed under the curved edge of the leaf, which leads to its skeletonization. In the later stages, pupation occurs in the formed rollers (figure 2: D).

At present, this phylophage is recorded in all neighboring countries: Lithuania (IVINSKIS, 2004), Latvia (KARSHOLT & NIEUKERKEN, 2013), Poland (KARSHOLT & RAZOWSKI 1996), Ukraine (KUZNETSOV & BARYSHNIKOVA, 1998), and Russia (BARYSHNIKOVA, 2019). Among host plants, in addition in the world are known: *Fraxinus americana* L., *F. angustifolia oxycarpa* (M. Bieb. Ex Willd.) Franco & Rocha Alonso, *F. anomala* Torr. Ex S. Wats., *F. chinensis rhynchophylla* Hance, *F. excelsior* L., *F. latifolia* Bebb., *F. nigra* Marshall, *F. ornus* L., *F. pennsylvanica* Marshall, *F. quadrangulata* Michx., *F. sogdiana* Bunge; *Jasminum* sp.; *Ligustrum ovalifolium* Hassk., *L. vulgare* L.; *Phillyrea* sp.; *Syringa vulgaris* L. (ELLIS, 2001, 2020; DE PRINS & DE PRINS, 2016).

The following species of ash trees are found in Belarus: *F. pennsylvanica*, *F. mandshurica* Rupr. (FEDORUK, 1972), *F. excelsior*, *Fraxinus angustifolia oxycarpa* (FEDORUK, 1985). *Fraxinus pennsylvanica* and *Fraxinus excelsior* have the largest area of growth (figure 3). There are 31 populations of *F. pennsylvanica* were counted on an area of 10.7 ha in the administrative regions of the country (figure 3: A). For *F. excelsior*, 65914 populations were recorded in an area of 34871.8 ha. The largest areas of growth of the species are concentrated in Vitebsk (8455.4 ha) and Gomel (8416.4 ha) regions, the smallest - in Grodno region (2345.8 ha) (figure 3: B) (MASLOVSKY *et al.*, 2019).

Also, among the potential host plants for Belarus, we can specify *Ligustrum vulgare* and *Syringa vulgaris* (FEDORUK, 1972). At the same time, 146 populations on an area of 34.1 ha in 25 administrative regions of Belarus have been taken into account for common lilac. By the occupied area, most common lilacs grow in the Brest region. However, due to the widespread use of lilac as a gardening plant, targeted studies are needed to better assess the distribution of *S. vulgaris* in Belarus (MASLOVSKY *et al.*, 2019). The area and density of privet growth are not specified at the moment.

Based on the above, it can be assumed that the species *C. cuculipennella* can be distributed throughout the territory of Belarus and can be found not only on ash, but also on other representatives of the Oleaceae family growing there.

Conclusions: A new phytophagous species *Caloptilia cuculipennella* (Hübner, 1796), which was identified by damages on leaves of common ash, is first recorded Belarus.

It is quite probable that the range of this species covers the entire territory of Belarus. Its host plants may include *F. excelsior*, *Fraxinus angustifolia oxyacarpa* and *F. pennsylvanica*, *Syringa vulgaris* and *Ligustrum vulgare* grown in Belarus. The common ash, *Fraxinus excelsior*, is presumably the principal host plant.

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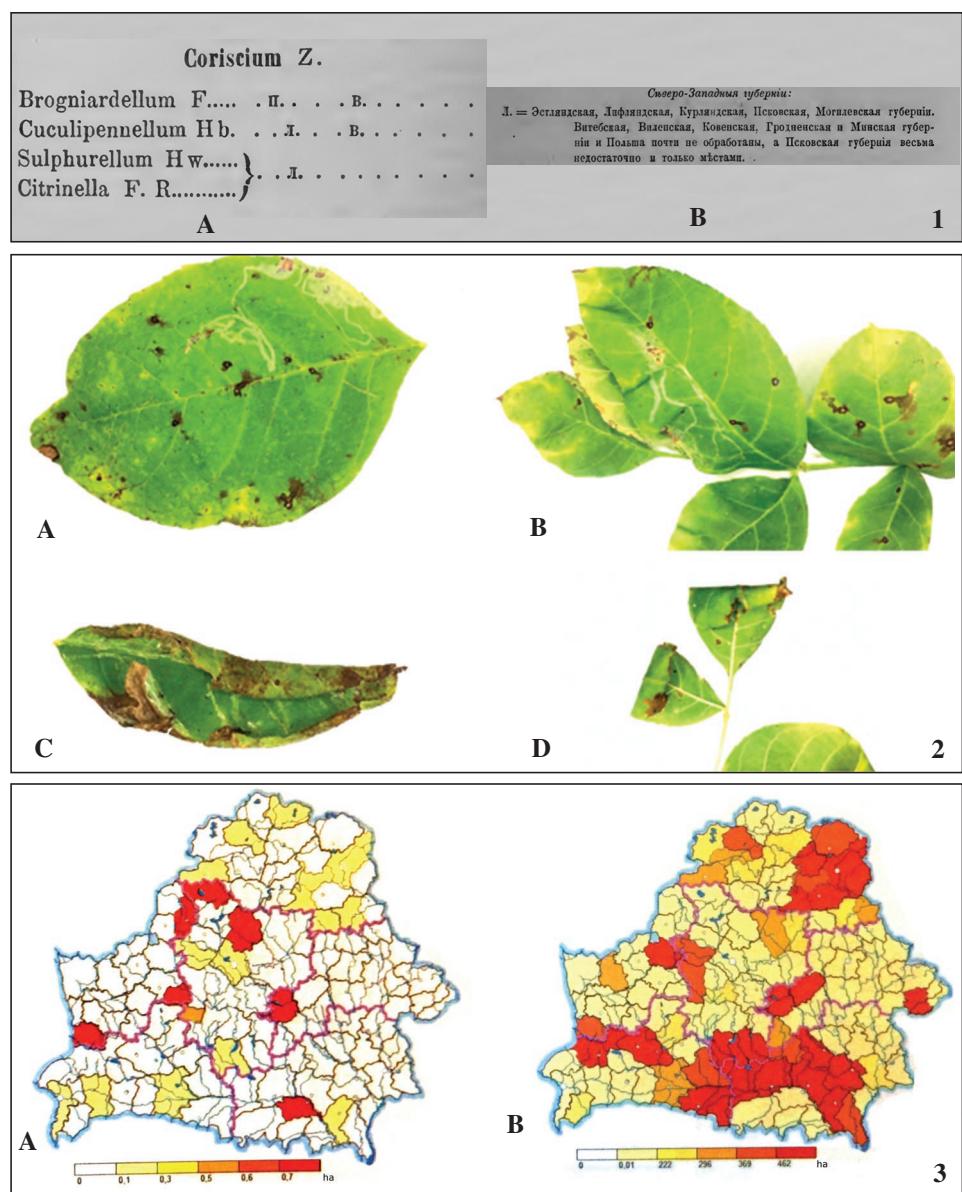
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Figures 1-3.- 1. The first reference to the presence of *Caloptilia cuculipennella* (Hübner, 1796) for the North-Western provinces of the Russian Empire (ERSHOV & FIELD, 1870); **A.** Species of the genus *Coriscium* (p. 186); **B.** Explanation of the abbreviation L. (p. 135). 2. Damaged leaf blades of *Fraxinus excelsior* L. by larvae of *Caloptilia cuculipennella* (Hübner, 1796): **A.-B.** Mines on leaf blades; **C.** deformed leaf from formed damages; **D.** Leaf rollers for pupation. 3. Occupied area of *F. pennsylvanica* (**A**) and *F. excelsior* (**B**) by administrative regions of Belarus (MASLOVSKY *et al.*, 2019).